AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the present application.

What is claimed is:

1. (Currently Amended) A tool insert comprising:

an abrasive layer having a periphery forming a cutting surface wherein said continuous abrasive layer comprises at least one of sintered polycrystalline diamond or sintered cubic boron nitride; and

a substrate, said abrasive layer being located on said substrate,

wherein said abrasive layer tool insert has a sum value of an impact resistance number and an abrasion resistance number ≥19,000, wherein the impact resistance number is equal to a total number of hits before failure of the tool insert and the abrasion resistance number is equal to equation (1)

(1) $$\text{abrasion resistance} = \frac{\text{final volume of granite removed by the tool insert (inch}^3\text{)}}{\text{final tool wear land area (inch}^2\text{).}}$$

2. (Currently Amended) The tool insert of claim 1, wherein ~~said~~ the abrasive layer ~~is sintered with a high pressure high temperature process.~~exhibits diamond-to-diamond bonding or cubic boron nitride particle-to-cubic boron nitride particle bonding.

3. (Currently Amended) The tool insert of claim 1, wherein said abrasive layer is formed from abrasive crystals, wherein the abrasive crystals comprise a bimodal powder mixture having at least one of the polycrystalline diamond or cubic boron nitride.

4. (Currently Amended) The tool insert of claim 3, wherein the bimodal powder mixture comprises fine particles having a fine particle size standard deviation of less than about six-tenths of an average fine particle size~~of a substantially uniform size~~ and coarse particles, having a coarse particle size standard deviation of less than about six-tenths of an average coarse particle size, wherein the average coarse particle size is different from the average fine particle size.~~of a substantially uniform size, said coarse particles having a different substantially uniform size than the substantially uniform size of the fine particles.~~

5. (Original) The tool insert of claim 4, wherein an average size ratio of fine particles over coarse particles is between about 0.02 and about 0.75.

6. (Original) The tool insert of claim 4, wherein an average size ratio of fine particles over coarse particles is between about 0.05 and about 0.5.

7. (Original) The tool insert of claim 4, wherein an average size ratio of fine particles over coarse particles is between about 0.1 and about 0.5.

8. (Original) The tool insert of claim 4, wherein a standard deviation of particle size distribution of fine particles and coarse particles is smaller than about 0.6d, where d is an average particle size.

9. (Currently Amended) The tool insert of claim 4, wherein abrasive crystals of said abrasive layer have an average aspect ratio ~~of particles of~~ greater than about 0.3.

10. (Currently Amended) The tool insert of claim 4, wherein abrasive crystals of said abrasive layer have an average aspect ratio ~~of particles of~~ greater than about 0.4.

11. (Currently Amended) The tool insert of claim 4, wherein abrasive crystals of said abrasive layer have an average aspect ratio ~~of particles of~~ greater than about 0.5.

12. (Original) The tool insert of claim 4, wherein a volume fraction of fine particles is between about 5% to 90%, and a volume fraction of coarse particles is between about 10% to about 95%.

13. (Original) The tool insert of claim 4, wherein a volume fraction of fine particles is between about 10% to 80%, and a volume fraction of coarse particles is between about 20% and about 90%.

14. (Original) The tool insert of claim 4, wherein a volume fraction of fine particles is between about 15% to 70%, and a volume fraction of coarse particles is between about 30% and about 85%.

15. (Original) The tool insert of claim 3, wherein said abrasive layer has at least about 93 vol.% of diamond.

16. (Currently Amended) A method for manufacturing a tool insert component comprising:

forming an abrasive layer with a bimodal powder comprising abrasive crystals of at least one of polycrystalline diamond and cubic boron nitride, wherein said abrasive crystals~~bimodal powder~~ comprise~~ing~~ fine particles having a fine particle size standard deviation of less than about six-tenths of an average fine particle size ~~of a substantially uniform size,~~ and coarse particles having a coarse particle size standard deviation of less than about six-tenths of an average coarse particle size, ~~of a substantially uniform size,~~ wherein the average coarse particle size is different from the average fine particle size, and ~~said coarse particles having a different substantially uniform size than the fine particles of substantially uniform size,~~ wherein the abrasive crystals of said abrasive layer have an average aspect ratio ~~of particles~~ greater than about 0.3; and

sintering said abrasive layer with a high pressure high temperature process resulting in a direct bonding between abrasive crystals of the abrasive layer.

17. (Original) The method according to claim 16, further comprising the step of bonding a substrate to said abrasive layer.

18. (Original) The method according to claim 16, wherein said abrasive layer having abrasion resistance and impact resistance properties, has a sum value of an impact resistance number and an abrasion resistance number ≥19,000, wherein the impact resistance number is equal to a total number of hits before failure of the tool insert and the abrasion resistance number is equal to equation (1)

(1) abrasion resistance = $\frac{\text{final volume of granite removed by the tool insert (inch}^3\text{)}}{\text{final tool wear land area (inch}^2\text{).}}$

19. (Original) The method of claim 16, wherein a volume fraction of fine particles is between about 5% to 90%, and a volume fraction of coarse particles is between about 10% and about 95%.

20. (Original) The method of claim 16, wherein an average size ratio of fine particles over coarse particles is about 0.02 to about 0.75.

21. (Currently Amended) A tool insert having increased abrasion resistance and impact resistance properties, comprising an abrasive layer and a substrate, wherein said abrasive layer is formed from a bimodal powder mixture comprising abrasive crystals of at least one of polycrystalline diamond and cubic boron nitride, wherein the abrasive crystals comprise fine particles having a fine particle size standard deviation of less than about six-tenths of an average

fine particle size, ~~of a substantially uniform size~~ and coarse particles having a coarse particle size standard deviation of less than about six-tenths of an average coarse particle size, ~~of a substantially uniform size,~~ wherein abrasive crystals of the abrasive layer have an average aspect ratio of ~~fine particles~~ greater than about 0.3; and wherein the abrasive crystals are directly bonded to each other.

22. (New) The tool insert of claim 4, wherein an average size ratio of fine particles over coarse particles is about 0.22.

23. (New) The tool insert of claim 21, wherein an average size ratio of fine particles over coarse particles is about 0.22.